Claims

[c1] 1.A microturbine power generating system, comprising:
a combustor for combusting a gaseous fuel to provide a supply of gaseous heat energy;
a radial gas compressor for delivering said gaseous fuel to said combustor; and
an electric motor to power said radial gas compressor.

[c2] 2.The system of claim 1, further comprising a turbine for converting the supply of gaseous heat energy into mechanical energy and an electrical generator driven by said turbine for converting mechanical energy produced by the turbine into electrical energy.

[c3] 3.The system of claim 2, further comprising a microturbine shaft connecting said turbine and said electrical generator;
further comprising one or more air-bearings to support said microturbine shaft; and
further comprising an air-bearing compressor to deliver a supply of compressed air to said one or more air-bearings.

[c4] 4.The system of claim 3, further comprising a compressor shaft connecting said radial gas compressor, said air-bearing compressor, and said electric motor;
further comprising one or more compressor air-bearings to support said compressor shaft; and
wherein said air-bearing compressor delivers a second supply of compressed air to said one or more compressor air-bearings.

[c5] 5.The system of claim 2, further comprising a compressor power turbine and wherein said radial gas compressor is powered by said compressor power turbine.

[c6] 6.The system of claim 5, wherein said electric motor powers said radial gas compressor during microturbine start-up; and
wherein said compressor power turbine powers said radial gas compressor after microturbine start-up is complete.

[c7] 7.The system of claim 6, further comprising an electromagnetic clutch such that

said electromagnetic clutch disengages said electric motor and engages said compressor power turbine once microturbine start-up is complete.

[c8] 8.The system of claim 6, wherein a portion of the supply of gaseous heat energy delivered to said turbine is diverted to said compressor power turbine; and wherein said compressor power turbine converts said portion of the supply of gaseous heat energy into mechanical energy.

[c9] 9.The system of claim 5, further comprising a microturbine shaft connecting said turbine and said electrical generator;
further comprising one or more air-bearings to support said microturbine shaft; and
further comprising an air-bearing compressor to deliver a supply of compressed air to said one or more air-bearings.

[c10] 10.The system of claim 9, further comprising a compressor shaft connecting said radial gas compressor, said air-bearing compressor, said compressor power turbine, and said electric motor;
further comprising one or more compressor air-bearings to support said compressor shaft; and
wherein said air-bearing compressor delivers a second supply of compressed air to said one or more compressor air-bearings.

[c11] 11.The system of claim 10, wherein said electric motor powers said radial gas compressor and said air-bearing compressor during microturbine startup; and wherein said compressor power turbine powers said radial gas compressor and said air-bearing compressor after microturbine start-up is complete.

[c12] 12.The system of claim 11, further comprising an electromagnetic clutch such that said electromagnetic clutch disengages said electric motor and engages said compressor power turbine once microturbine start-up is complete.

[c13] 13.The system of claim 10, wherein a portion of the supply of gaseous heat energy delivered to said turbine is diverted to said compressor power turbine; and
wherein said compressor power turbine converts said portion of the supply of

gaseous heat energy into mechanical energy.

[c14] 14.A method of operating a microturbine power generating system that has a combustor, a turbine, an electrical generator, a radial gas compressor, and an electric motor, comprising:
combusting a gaseous fuel to gaseous heat energy in said combustor;
converting gaseous heat energy into mechanical energy by said turbine;
converting mechanical energy into electrical energy by said electrical generator; and
delivering a supply of said gaseous fuel to said combustor by said radial gas compressor powered by said electric motor.

[c15] 15.The method of claim 14, wherein said turbine and said electrical generator are connected by a microturbine shaft; and wherein said microturbine shaft is supported by one or more air-bearings, further comprising delivering a supply of compressed air to said one or more air-bearings of said microturbine shaft by an air-bearing compressor.

[c16] 16.The method of claim 15, wherein said radial gas compressor, said air-bearing compressor, and said electric motor are connected by a compressor shaft; and wherein said compressor shaft is supported by one or more compressor air-bearings, further comprising delivering a second supply of compressed air to said one or more compressor air-bearings by said air-bearing compressor.

[c17] 17.The method of claim 14, further comprising powering said radial gas compressor by a compressor power turbine.

[c18] 18.The method of claim 17, further comprising:
powering said radial gas compressor during microturbine start-up by said electric motor; and
powering said radial gas compressor after microturbine start-up is complete by said compressor power turbine.

[c19] 19.The method of claim 18, further comprising disengaging said electric motor and engaging said compressor power turbine once microturbine start-up is

completed by an electromagnetic clutch.

[c20] 20.The method of claim 17, further comprising:
diverting a portion of the supply of gaseous heat energy delivered to said turbine; and
using said portion of the supply of gaseous heat energy in said compressor power turbine to produce mechanical energy.

[c21] 21.The method of claim 17, wherein said turbine and said electrical generator are connected by a microturbine shaft; and wherein said microturbine shaft is supported by one or more air-bearings, further comprising delivering a supply of compressed air to said one or more air-bearings of said microturbine shaft by an air-bearing compressor.

[c22] 22.The method of claim 21, wherein said radial gas compressor, said air-bearing compressor, said compressor power turbine, and said electric motor are connected by a compressor shaft; and wherein said compressor shaft is supported by one or more compressor air-bearings, further comprising delivering a second supply of compressed air to said one or more compressor air-bearings by said air-bearing compressor.

[c23] 23.The method of claim 22, further comprising:
powering said radial gas compressor and said air-bearing compressor during microturbine start-up by said electric motor; and
powering said radial gas compressor and said air-bearing compressor after microturbine start-up is complete by said compressor power turbine.

[c24] 24.The method of claim 23, further comprising disengaging said electric motor and engaging said compressor power turbine once microturbine start-up is completed by an electromagnetic clutch.

[c25] 25.The method of claim 23, further comprising:
diverting a portion of the supply of gaseous heat energy delivered to said turbine; and
using said portion of the supply of gaseous heat energy in said compressor power turbine to produce mechanical energy.

[c26] 26.A microturbine power generating system, comprising:
a combustor for combusting a gaseous fuel to provide a supply of gaseous heat energy;
a turbine for converting the supply of gaseous heat energy into mechanical energy;
an electrical generator driven by said turbine for converting mechanical energy produced by the turbine into electrical energy;
a radial gas compressor for delivering said gaseous fuel to said combustor;
a microturbine shaft connecting said turbine and said electrical generator;
a compressor shaft connecting said radial gas compressor, said electric motor, and an air-bearing compressor;
an electric motor to power said radial gas compressor and said air-bearing compressor;
one or more air-bearings to support said microturbine shaft; and
one or more compressor air-bearings to support said compressor shaft;
wherein said air-bearing compressor delivers a supply of compressed air to said one or more air-bearings and said one or more compressor air-bearings.

[c27] 27.A microturbine power generating system, comprising:
a combustor for combusting a gaseous fuel to provide a supply of gaseous heat energy;
a turbine for converting the supply of gaseous heat energy into mechanical energy;
an electrical generator driven by said turbine for converting mechanical energy produced by the turbine into electrical energy;
a radial gas compressor for delivering said gaseous fuel to said combustor;
an electric motor to power said radial gas compressor during microturbine start-up; and
a compressor power turbine to power said radial gas compressor once microturbine startup is complete.

[c28] 28.The system of claim 27, wherein a portion of the supply of gaseous heat energy delivered to said turbine is diverted to said compressor power turbine; and

wherein said compressor power turbine converts said portion of the supply of gaseous heat into mechanical energy.

[c29] 29.A microturbine power generating system, comprising:
a combustor for combusting a gaseous fuel to provide a supply of gaseous heat energy;
a turbine for converting the supply of gaseous heat energy into mechanical energy;
an electrical generator driven by said turbine for converting mechanical energy produced by the turbine into electrical energy;
a radial gas compressor for delivering said gaseous fuel to said combustor;a microturbine shaft connecting said turbine and said electrical generator;
a compressor shaft connecting said radial gas compressor, and said electric motor, an air-bearing compressor, and an compressor power turbine;
one or more air-bearings to support said microturbine shaft;
one or more compressor air-bearings to support said compressor shaft; and
an electric motor to power said radial gas compressor and said air-bearing compressor during microturbine start-up;
wherein said compressor power turbine powers said radial gas compressor and said air-bearing compressor once microturbine startup is complete.

[c30] 30.The system of claim 29, wherein said air-bearing compressor delivers a supply of compressed air to said one or more air-bearings and said one or more compressor air-bearings.

[c31] 31.The system of claim 30, wherein a portion of the supply of gaseous heat energy delivered to said turbine is diverted to said compressor power turbine; and
wherein said compressor power turbine converts said portion of the supply of gaseous heat into mechanical energy.